Internet Offload

Purpose Of White Paper

The purpose of this white paper is to explore Internet Offload as an effective solution for Internet Service Providers (ISPs) and Local Exchange Carriers (LECs). The paper discusses the issues, challenges and potential solutions to diverting Internet traffic from the PSTN to packet-switched networks.

Introduction

Although high-speed Internet access through ISDN, DSL or cable connections is becoming increasingly popular, dial-up modems are still the most common access method used by customers. The increase in dial-up traffic creates challenges for traditional communications infrastructure which was designed for transporting voice. Compared to voice calls, data calls are characterized with longer duration, have unpredictable call patterns, and are concentrated to switches located near ISPs.

Internet Offload is an effective solution for overcoming the problems created by dial-up Internet access. In essence the solution diverts data traffic from the PSTN and routes it directly to packet-switched networks. Besides providing cost efficiency, Internet Offload is often one of the first applications in a carrier's migration strategy to packet-based infrastructure.

Local Exchange Carriers Perspective

Whether LECs offer their own Internet service or sell access to ISPs, dial-up Internet access is a major source of network traffic for them. Unlike traditional voice calls which last on average few minutes, Internet access calls can tie up network resource for hours. Yet Internet users generally pay a flat fee, regardless of their resource usage. In essence, by serving dial-up users, LECs lose the opportunity to generate incremental revenues from their network resources through using them for more profitable and usage based voice services.

To address the situation, LECs have two choices: (1) They can add Class 5 switching and port capacity, or (2) They can "offload" access lines from their legacy Class 5 switch to free up network resources. Given the revenue potential for providing Internet access, the incremental costs associated with increasing the capacity of a Legacy Class 5 switch are rarely justified. Internet Offload, which will be discussed in detail below, is a better and less costly alternative.

Internet Service Providers' Perspective

Although high-speed Internet access through DSL or cable are the ultimate customer choices, many ISPs realize that the process to converting existing dial-up customers will be gradual and take time. Meanwhile, ISPs are looking for ways to reduce costs of offering dial-up access in order to improve profitability.

In a typical business scenario, ISPs have to purchase Integrated Services Digital Network (ISDN) Primary Rate Interface (PRI) to gain dial-up access to their subscribers (through the PSTN). In such case, LECs treat ISPs just like any other business customer and charge them business retail rates for that access. Internet Offload, on the other hand allows ISPs to redirect data traffic away from the PSTN network and to substantially reduce costs.

Internet Offload Solution

Fig. 1 shows a typical dial-up Internet session. Dial-up connection is established through the following steps:

    1) The Internet subscriber's modem dials the ISP access number.

    2) The switch serving that number launches a call setup request via the SS7 network.

    3) The SS7 network routes the call request to the switch serving the ISP.

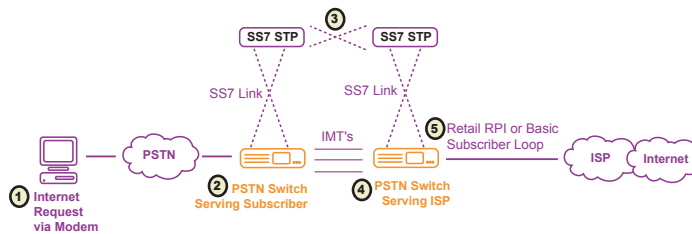   4) The call is completed on the ISP's retail PRIs. The ISP network then routes data requests as needed.

Fig.2 shows dial-up session with Internet Offload. Dial-up connection is established as follows:

    1) The Internet subscriber's modem dials the ISP access number.

    2) The switch serving that number launches a call setup request via the SS7 network.

    3) The SS7 network routes the request to a Softswitch/Internet Call Diversion (ICD) device. The softswitch translates the SS7 call setup request to Internet protocol and communicates the request to the Remote Access Server (RAS).

    4) The RAS acknowledges the request and the data session is established on the Inter-Machine Trunks (IMTs). The ISP network then routes data requests as needed.
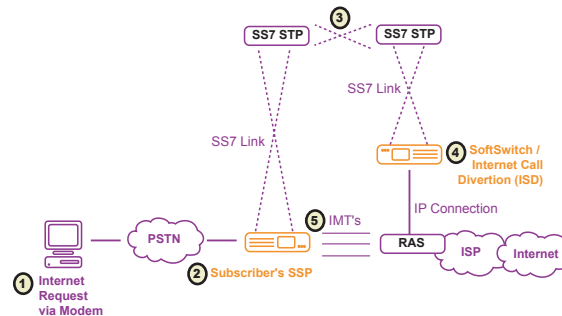
With Internet Offload solution, the original call setup request is rerouted to the Softswitch/ICD which together with the RAS emulated the call termination function of a PSTN switch. In effect the Internet Offload solution diverts Internet calls from the LEC switch to the RAS, freeing switch capacity.

How Internet Offload benefits LECs and ISPs? Using Internet Offload, LECs can efficiently utilize their PSTN switches to handle more profitable voice traffic. They can also generate incremental revenues by offering ICD services to smaller ISPs. ISPs also benefit from the Internet Offload as it allows them to substitute PRIs for IMTs which are 25%-30% cheaper.

Conclusion

As the use of Internet continues to grow, increased data traffic will continuously put pressure on PSTN infrastructure. Although today's consensus is that the telecommunications industry will inevitably migrate to a pure IP architecture, the need for interoperability between the new and the old infrastructure will continue for an unforeseen period of time. In the meantime, both LECs and ISPs need to look for the most efficient and cost-effective method to provide services and manage their network infrastructures. Internet Offload is one such solution that all LECs and ISPs should consider as it improves network efficiency and reduces costs.